

DIGITAL FILTER METHODS AND STRUCTURES  
FOR INCREASED PROCESSING RATES

ABSTRACT OF THE DISCLOSURE

Digital filters are provided that include a converter and a data processor. The converter converts successive strings of M successive data elements that occur at a system rate  $F_s$  in an input data stream  $D_{in}$  to M parallel data elements that respectively occur at a substream rate  $F_s/M$  in M data substreams  $D_{sbstrm}$ . At a reduced substream rate  $F_s/M$ , the processor generates M convolutions of the filter's quantized impulse response with the M data substreams wherein each of the convolutions is arranged to generate a different one of M successive filtered output signals. Because the convolutions are conducted at the reduced substream rate  $F_s/M$ , the filters can operate at increased system rates. Preferably, the digital filter also includes a multiplexer that selects, at the system rate  $F_s$ , the M filtered output signals in successive order to thereby form a filtered output data stream  $D_{out}$ .